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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Jun ANDOH, et al.

SERIAL NO: 09/888,600

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EXAMINER: THOMAS, BRANDIN

FOR: FIXING STRUCTURE FOR PARTS OF OPTICAL ELEMENT, IMAGE DATA INPUT UNIT AND IMAGE DATA INPUT APPARATUS

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Applicant(s) wish to disclose the following information.

REFERENCES

- ☐ The applicant(s) wish to make of record the references listed on the attached form PTO-1449. Copies of the listed references are attached, where required, as are either statements of relevancy or any readily available English translations of pertinent portions of any non-English language references.
- ☐ A check is attached in the amount required under 37 CFR §1.17(p).

RELATED CASES

- ☒ Attached is a list of applicant's pending application(s) or issued patent(s) which may be related to the present application. A copy of the claims and drawings of the pending application(s) is attached.
- ☒ A check is attached in the amount required under 37 CFR §1.17(p).

CERTIFICATION

- ☐ Each item of information contained in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.
- ☒ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this statement.

DEPOSIT ACCOUNT

- ☒ Please charge any additional fees for the papers being filed herewith and for which no check or credit card payment form is enclosed herewith, or credit any overpayment to deposit account number 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

  
Gregory J. Maier

Registration No. 25,599

Joseph A. Scafetta, Jr.  
Registration No. 26,803

Customer Number

22850

Tel. (703) 413-3000  
Fax. (703) 413-2220  
(OSMMN 05/03)

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**LIST OF RELATED CASES**

<u>Docket Number</u>	<u>Serial or Patent Number</u>	<u>Filing or Issue Date</u>	<u>Inventor/ Applicant</u>
210290US3*	09/888,600	06/26/01	ANDOH et al.
239046US2X	10/461,422	06/16/03	MORII et al.

\*Present Application; listed for information  
GJM/sb

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**WHAT IS CLAIMED IS:**

1. A toner recycling method comprising:
  - a toner collection process of collecting a toner;
  - a granulation process of manufacturing granules from the toner;
  - 5 a requirement information acquiring process of acquiring information about requirement of the granules from a prospective purchaser of the granules;
  - a recycling information generation process of generating recycling information about a toner required for manufacturing of the
  - 10 granules by the purchaser and sending the recycling information, wherein the recycling information is generated based on the information about requirement of the granules, the recycling information is generated by using a computer, and the recycling information is sent via a network; and
  - 15 a toner information management process of receiving the recycling information and managing information about the toner collected based on the recycling information, by using a computer.
2. The toner recycling method according to claim 1, wherein the
- 20 granules are used as a flux for manufacturing steel.
3. The toner recycling method according to claim 1, wherein the granulation process includes mixing the toner with at least one of aluminum dregs, mineral based powder particles, and metal-based
- 25 powder particles made from aluminum dross, aluminum ash, and

aluminum mineral dregs generated during an aluminum refining process.

4. The toner recycling method according to claim 1, wherein the  
5 toner collection process includes collecting toner remained in a used  
toner receptacle.

5. The toner recycling method according to claim 1, wherein the  
toner collection process includes collecting non-standardized toner.

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6. The toner recycling method according to claim 4, wherein the  
toner collection process comprises:

a recovery process of recovering a toner containing unit, where  
the toner containing unit is one or more selected from a combination of  
15 an image forming apparatus, a built-in unit in an image forming  
apparatus from which toner can be recovered, and a consumable  
product; and

a separation process of separating the toner remained in the  
toner containing unit.

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7. The toner recycling method according to claim 6, wherein the  
recovery process is carried out in a recovery center and the separation  
process is carried out in a recycling center.

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8. The toner recycling method according to claim 1, wherein the separation process includes separating the toner based on a color of the toner.

5 9. The toner recycling method according to claim 8, wherein in the granulation process includes mixing toners of different colors to manufacture the granules of a specific color.

10 10. The toner recycling method according to claim 1, wherein the recycling information includes toner acceptance standards for acceptance of toner by the granulation process from the toner collection process and this acceptance standard has at least one standard out of toner color, whether any material is to be mixed with the toner, a material to be mixed, and a toner material.

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11. The toner recycling method according to claim 1, wherein the recycling information includes a purchase management information, wherein the purchase management information indicates an amount of toner to be received by the granulation process from the toner collection process and the quantity of toner indicated in the purchase management information is provided by the toner collection process to the granulation process.

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12. The toner recycling method according to claim 1, wherein in the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the recycling information.

13. The toner recycling method according to claim 10, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

14. The toner recycling method according to claim 11, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

15. The toner recycling method according to claim 12, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

16. The toner recycling method according to claim 1, further comprising:

a status management process of managing information that includes at least one of a status of toner collection in the toner collection process, a status of providing of toner to the granulation process and status of use of the granules provided by the granulation process to a steel manufacturer.

17. The toner recycling method according to claim 16, wherein the status management process includes managing at least one of the data among recycling rate data, material recycling rate data, and energy recovery rate data that is calculated by using a collection information about a quantity of toner collected, an information to be provided to the granulation process about a quality and a quantity of toner that is supplied to the granulation process, an information which is not provided to the granulation process about a quantity and disposal of a toner that is collected but not sent to the granulation process, the information of toner collection, and the information provided to the granulation process, and the information not provided to the granulation process.

18. The toner recycling method according to claim 1, wherein the granules are pillow-shaped with blunt corners, the pillow-shape being a shape having a convex top face and a bottom face with same curvature of top and bottom convex surfaces, and the curvature is less than that

of a spherical surface of a sphere.

19. The toner recycling method according to claim 1, wherein the granules formed are substantially cylindrical.

5

20. The toner recycling system according to claim 17, wherein the granules are manufactured by mixing a toner with at least one of aluminum dregs, mineral based powder particles, and metal based powder particles made from aluminum dross, aluminum ash, and  
10 aluminum mineral dregs generated during an aluminum refining process.

21. A toner recycling method comprising:

a granulation process of manufacturing granules using a toner;  
15 a requirement information acquiring process of acquiring information about requirement of the granules from a prospective purchaser of the granules; and  
a recycling information generation process of generating recycling information about a toner required for manufacturing of the  
20 granules by the purchaser and sending the recycling information, wherein the recycling information is generated based on the information about requirement of the granules, the recycling information is generated by using a computer, and the recycling information is sent via a network.

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22. The toner recycling method according to claim 21, wherein the granules are used as a flux for manufacturing steel.

23. The toner recycling method according to claim 21, wherein the  
5 granulation process includes mixing the toner with at least one of aluminum dregs, mineral based powder particles, and metal-based powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining process.

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24. The toner recycling method according to claim 21, wherein the toner collection process includes collecting toner remained in a used toner receptacle.

15 25. The toner recycling method according to claim 21, wherein the toner collection process includes collecting non-standardized toner.

26. The toner recycling method according to claim 24, wherein the toner collection process comprises:

20 a recovery process of recovering a toner containing unit, where the toner containing unit is one or more selected from a combination of an image forming apparatus, a built-in unit in an image forming apparatus from which toner can be recovered, and a consumable product; and

25 a separation process of separating the toner remained in the

toner containing unit.

27. The toner recycling method according to claim 26, wherein the recovery process is carried out in a recovery center and the separation  
5 process is carried out in a recycling center.

28. The toner recycling method according to claim 21, wherein the separation process includes separating the toner based on a color of the toner.

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29. The toner recycling method according to claim 28, wherein in the granulation process includes mixing toners of different colors to manufacture the granules of a specific color.

15 30. The toner recycling method according to claim 21, wherein the recycling information includes toner acceptance standards for acceptance of toner by the granulation process from the toner collection process and this acceptance standard has at least one standard out of toner color, whether any material is to be mixed with the toner, a  
20 material to be mixed, and a toner material.

31. The toner recycling method according to claim 21, wherein the recycling information includes a purchase management information, wherein the purchase management information indicates an amount of  
25 toner to be received by the granulation process from the toner

collection process and the quantity of toner indicated in the purchase management information is provided by the toner collection process to the granulation process.

5     32.     The toner recycling method according to claim 21, wherein in the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the recycling information.

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33.     The toner recycling method according to claim 30, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection  
15     process.

34.     The toner recycling method according to claim 31, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the  
20     granulation process and a computer at a site of the toner collection process.

35.     The toner recycling method according to claim 32, wherein the communication device is a computer and the recycling information is  
25     transmitted via the Internet between a computer at a site of the

granulation process and a computer at a site of the toner collection process.

36. The toner recycling method according to claim 21, further  
5 comprising:

a status management process of managing information that includes at least one of a status of toner collection in the toner collection process, a status of providing of toner to the granulation process and status of use of the granules provided by the granulation  
10 process to a steel manufacturer.

37. The toner recycling method according to claim 36, wherein the status management process includes managing at least one of the data among recycling rate data, material recycling rate data, and energy  
15 recovery rate data that is calculated by using a collection information about a quantity of toner collected, an information to be provided to the granulation process about a quality and a quantity of toner that is supplied to the granulation process, an information which is not provided to the granulation process about a quantity and disposal of a  
20 toner that is collected but not sent to the granulation process, the information of toner collection, and the information provided to the granulation process, and the information not provided to the granulation process.

38. The toner recycling method according to claim 21, wherein the granules are pillow-shaped with blunt corners, the pillow-shape being a shape having a convex top face and a bottom face with same curvature of top and bottom convex surfaces, and the curvature is less than that of a spherical surface of a sphere.

39. The toner recycling method according to claim 21, wherein the granules formed are substantially cylindrical.

40. The toner recycling system according to claim 37, wherein the granules are manufactured by mixing a toner with at least one of aluminum dregs, mineral based powder particles, and metal based powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining process.

41. A toner recycling method comprising:  
a toner collection process of collecting toner;  
a granulation process of manufacturing granules from the toner;  
a receiving process of receiving recycling information about toner required for manufacturing of the granules by the purchaser; and  
a toner information management process of managing the recycling information and managing information about the toner collected based on the recycling information, by using a computer.

42. The toner recycling method according to claim 41, wherein the granules are used as a flux for manufacturing steel.

43. The toner recycling method according to claim 41, wherein the  
5 granulation process includes mixing the toner with at least one of aluminum dregs, mineral based powder particles, and metal-based powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining process.

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44. The toner recycling method according to claim 41, wherein the toner collection process includes collecting toner remained in a used toner receptacle.

15 45. The toner recycling method according to claim 41, wherein the toner collection process includes collecting non-standardized toner.

46. The toner recycling method according to claim 44, wherein the toner collection process comprises:

20 a recovery process of recovering a toner containing unit, where the toner containing unit is one or more selected from a combination of an image forming apparatus, a built-in unit in an image forming apparatus from which toner can be recovered, and a consumable product; and

25 a separation process of separating the toner remained in the

toner containing unit.

47. The toner recycling method according to claim 46, wherein the recovery process is carried out in a recovery center and the separation  
5 process is carried out in a recycling center.

48. The toner recycling method according to claim 41, wherein the separation process includes separating the toner based on a color of the toner.  
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49. The toner recycling method according to claim 48, wherein in the granulation process includes mixing toners of different colors to manufacture the granules of a specific color.

15 50. The toner recycling method according to claim 41, wherein the recycling information includes toner acceptance standards for acceptance of toner by the granulation process from the toner collection process and this acceptance standard has at least one standard out of toner color, whether any material is to be mixed with the toner, a  
20 material to be mixed, and a toner material.

51. The toner recycling method according to claim 41, wherein the recycling information includes a purchase management information, wherein the purchase management information indicates an amount of  
25 toner to be received by the granulation process from the toner

collection process and the quantity of toner indicated in the purchase management information is provided by the toner collection process to the granulation process.

5     52.     The toner recycling method according to claim 41, wherein in the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the recycling information.

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53.     The toner recycling method according to claim 50, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection  
15     process.

54.     The toner recycling method according to claim 51, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the  
20     granulation process and a computer at a site of the toner collection process.

55.     The toner recycling method according to claim 52, wherein the communication device is a computer and the recycling information is  
25     transmitted via the Internet between a computer at a site of the



granulation process and a computer at a site of the toner collection process.

56. The toner recycling method according to claim 41, further comprising:

a status management process of managing information that includes at least one of a status of toner collection in the toner collection process, a status of providing of toner to the granulation process and status of use of the granules provided by the granulation process to a steel manufacturer.

57. The toner recycling method according to claim 56, wherein the status management process includes managing at least one of the data among recycling rate data, material recycling rate data, and energy recovery rate data that is calculated by using a collection information about a quantity of toner collected, an information to be provided to the granulation process about a quality and a quantity of toner that is supplied to the granulation process, an information which is not provided to the granulation process about a quantity and disposal of a toner that is collected but not sent to the granulation process, the information of toner collection, and the information provided to the granulation process, and the information not provided to the granulation process.

58. The toner recycling method according to claim 41, wherein the granules are pillow-shaped with blunt corners, the pillow-shape being a shape having a convex top face and a bottom face with same curvature of top and bottom convex surfaces, and the curvature is less than that  
5 of a spherical surface of a sphere.

59. The toner recycling method according to claim 41, wherein the granules formed are substantially cylindrical.

10 60. The toner recycling system according to claim 57, wherein the granules are manufactured by mixing a toner with at least one of aluminum dregs, mineral based powder particles, and metal based powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining  
15 process.

61. A toner recycling method comprising:  
a toner collection process of collecting toner used in image formation; and  
20 a granulation process of manufacturing granules by mixing the toner with other component.

62. The toner recycling method according to claim 61, wherein the granules are used as a flux for manufacturing steel.

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63. The toner recycling method according to claim 61, wherein the granulation process includes mixing the toner with at least one of aluminum dregs, mineral based powder particles, and metal-based powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining process.

64. The toner recycling method according to claim 61, wherein the toner collection process includes collecting toner remained in a used toner receptacle.

65. The toner recycling method according to claim 61, wherein the toner collection process includes collecting non-standardized toner.

66. The toner recycling method according to claim 64, wherein the toner collection process comprises:

a recovery process of recovering a toner containing unit, where the toner containing unit is one or more selected from a combination of an image forming apparatus, a built-in unit in an image forming apparatus from which toner can be recovered, and a consumable product; and

a separation process of separating the toner remained in the toner containing unit.

67. The toner recycling method according to claim 66, wherein the recovery process is carried out in a recovery center and the separation process is carried out in a recycling center.

5 68. The toner recycling method according to claim 61, wherein the separation process includes separating the toner based on a color of the toner.

69. The toner recycling method according to claim 68, wherein in  
10 the granulation process includes mixing toners of different colors to manufacture the granules of a specific color.

70. The toner recycling method according to claim 61, wherein  
the granulation process includes sending the recycling  
15 information to the toner collection process by using a communication device, and  
the toner collection process includes receiving the recycling information by using a communication device and provided appropriate toner to the granulation process based on the recycling information.

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71. The toner recycling method according to claim 70, wherein the recycling information includes toner acceptance standards for acceptance of toner by the granulation process from the toner collection process and this acceptance standard has at least one standard out of  
25 toner color, whether any material is to be mixed with the toner, a

material to be mixed, and a toner material.

72. The toner recycling method according to claim 67, wherein the recycling information includes a purchase management information,  
5 wherein the purchase management information indicates an amount of toner to be received by the granulation process from the toner collection process and the quantity of toner indicated in the purchase management information is provided by the toner collection process to the granulation process.

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73. The toner recycling method according to claim 68, wherein the recycling information includes a purchase management information, wherein the purchase management information indicates an amount of toner to be received by the granulation process from the toner  
15 collection process and the quantity of toner indicated in the purchase management information is provided by the toner collection process to the granulation process.

74. The toner recycling method according to claim 67, wherein in  
20 the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the recycling information.

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75. The toner recycling method according to claim 68, wherein in the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the recycling information.

76. The toner recycling method according to claim 70, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

77. The toner recycling method according to claim 71, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

78. The toner recycling method according to claim 72, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

79. The toner recycling method according to claim 73, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection  
5 process.

80. The toner recycling method according to claim 74, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the  
10 granulation process and a computer at a site of the toner collection process.

81. The toner recycling method according to claim 75, wherein the communication device is a computer and the recycling information is  
15 transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

82. The toner recycling method according to claim 61, further  
20 comprising:

a status management process of managing information that includes at least of one of a status of toner collection in the toner collection process, a status of providing of toner to the granulation process and status of use of the granules provided by the granulation  
25 process to a steel manufacturer.

83. The toner recycling method according to claim 82, wherein the status management process includes managing at least one of the data among recycling rate data, material recycling rate data, and energy recovery rate data that is calculated by using a collection information  
5 about a quantity of toner collected, an information to be provided to the granulation process about a quality and a quantity of toner that is supplied to the granulation process, an information which is not provided to the granulation process about a quantity and disposal of a toner that is collected but not sent to the granulation process, the  
10 information of toner collection, and the information provided to the granulation process, and the information not provided to the granulation process.

84. The toner recycling method according to claim 61, wherein the  
15 granules are pillow-shaped with blunt corners, the pillow-shape being a shape having a convex top face and a bottom face with same curvature of top and bottom convex surfaces, and the curvature is less than that of a spherical surface of a sphere.

20 85. The toner recycling method according to claim 61, wherein the granules formed are substantially cylindrical.

86. The toner recycling system according to claim 83, wherein the granules are manufactured by mixing a toner with at least one of  
25 aluminum dregs, mineral based powder particles, and metal based



powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining process.

5    87.     A toner recycling method comprising:  
         a toner collection process of collecting toner used in image  
         formation and providing the toner to a granulation process of  
         manufacturing granules.

10   88.     The toner recycling method according to claim 87, wherein the  
         granules are used as a flux for manufacturing steel.

         89.     The toner recycling method according to claim 87, wherein the  
         granulation process includes mixing the toner with at least one of  
15   aluminum dregs, mineral based powder particles, and metal-based  
         powder particles made from aluminum dross, aluminum ash, and  
         aluminum mineral dregs generated during an aluminum refining  
         process.

20   90.     The toner recycling method according to claim 87, wherein the  
         toner collection process includes collecting toner remained in a used  
         toner receptacle.

         91.     The toner recycling method according to claim 87, wherein the  
25   toner collection process includes collecting non-standardized toner.

92. The toner recycling method according to claim 90, wherein the toner collection process comprises:

a recovery process of recovering a toner containing unit, where the toner containing unit is one or more selected from a combination of  
5 an image forming apparatus, a built-in unit in an image forming apparatus from which toner can be recovered, and a consumable product; and

a separation process of separating the toner remained in the toner containing unit.

10

93. The toner recycling method according to claim 92, wherein the recovery process is carried out in a recovery center and the separation process is carried out in a recycling center.

15 94. The toner recycling method according to claim 87, wherein the separation process includes separating the toner based on a color of the toner.

95. The toner recycling method according to claim 94, wherein in  
20 the granulation process includes mixing toners of different colors to manufacture the granules of a specific color.

96. The toner recycling method according to claim 87, wherein  
the granulation process includes sending the recycling  
25 information to the toner collection process by using a communication

device, and

the toner collection process includes receiving the recycling information by using a communication device and provided appropriate toner to the granulation process based on the recycling information.

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97. The toner recycling method according to claim 96, wherein the recycling information includes toner acceptance standards for acceptance of toner by the granulation process from the toner collection process and this acceptance standard has at least one standard out of  
10 toner color, whether any material is to be mixed with the toner, a material to be mixed, and a toner material.

98. The toner recycling method according to claim 93, wherein the recycling information includes a purchase management information,  
15 wherein the purchase management information indicates an amount of toner to be received by the granulation process from the toner collection process and the quantity of toner indicated in the purchase management information is provided by the toner collection process to the granulation process.

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99. The toner recycling method according to claim 94, wherein the recycling information includes a purchase management information, wherein the purchase management information indicates an amount of toner to be received by the granulation process from the toner  
25 collection process and the quantity of toner indicated in the purchase

management information is provided by the toner collection process to the granulation process.

100. The toner recycling method according to claim 93, wherein in  
5 the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the recycling information.

10 101. The toner recycling method according to claim 94, wherein in the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the recycling information.

15 102. The toner recycling method according to claim 96, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection  
20 process.

103. The toner recycling method according to claim 97, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the  
25 granulation process and a computer at a site of the toner collection

process.

104. The toner recycling method according to claim 98, wherein the communication device is a computer and the recycling information is  
5 transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

105. The toner recycling method according to claim 99, wherein the  
10 communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

15 106. The toner recycling method according to claim 100, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

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107. The toner recycling method according to claim 101, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection  
25 process.

108. The toner recycling method according to claim 87, further comprising:

a status management process of managing information that includes at least one of a status of toner collection in the toner  
5 collection process, a status of providing of toner to the granulation process and status of use of the granules provided by the granulation process to a steel manufacturer.

109. The toner recycling method according to claim 108, wherein the  
10 status management process includes managing at least one of the data among recycling rate data, material recycling rate data, and energy recovery rate data that is calculated by using a collection information about a quantity of toner collected, an information to be provided to the granulation process about a quality and a quantity of toner that is  
15 supplied to the granulation process, an information which is not provided to the granulation process about a quantity and disposal of a toner that is collected but not sent to the granulation process, the information of toner collection, and the information provided to the granulation process, and the information not provided to the granulation  
20 process.

110. The toner recycling method according to claim 87, wherein the granules are pillow-shaped with blunt corners, the pillow-shape being a shape having a convex top face and a bottom face with same curvature  
25 of top and bottom convex surfaces, and the curvature is less than that

of a spherical surface of a sphere.

111. The toner recycling method according to claim 87, wherein the granules formed are substantially cylindrical.

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112. The toner recycling system according to claim 109, wherein the granules are manufactured by mixing a toner with at least one of aluminum dregs, mineral based powder particles, and metal based powder particles made from aluminum dross, aluminum ash, and  
10 aluminum mineral dregs generated during an aluminum refining process.

113. A toner recycling method comprising:  
a granulation process of manufacturing granules by mixing toner  
15 used in image formation with other component.

114. The toner recycling method according to claim 113, wherein the granules are used as a flux for manufacturing steel.

20 115. The toner recycling method according to claim 113, wherein the granulation process includes mixing the toner with at least one of aluminum dregs, mineral based powder particles, and metal-based powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining  
25 process.

116. The toner recycling method according to claim 113, wherein the toner collection process includes collecting toner remained in a used toner receptacle.

5 117. The toner recycling method according to claim 113, wherein the toner collection process includes collecting non-standardized toner.

118. The toner recycling method according to claim 116, wherein the toner collection process comprises:

10 a recovery process of recovering a toner containing unit, where the toner containing unit is one or more selected from a combination of an image forming apparatus, a built-in unit in an image forming apparatus from which toner can be recovered, and a consumable product; and

15 a separation process of separating the toner remained in the toner containing unit.

119. The toner recycling method according to claim 118, wherein the recovery process is carried out in a recovery center and the separation  
20 process is carried out in a recycling center.

120. The toner recycling method according to claim 113, wherein the separation process includes separating the toner based on a color of the toner.

25



121. The toner recycling method according to claim 120, wherein in the granulation process includes mixing toners of different colors to manufacture the granules of a specific color.

5 122. The toner recycling method according to claim 113, wherein the granulation process includes sending the recycling information to the toner collection process by using a communication device, and the toner collection process includes receiving the recycling  
10 information by using a communication device and provided appropriate toner to the granulation process based on the recycling information.

123. The toner recycling method according to claim 122, wherein the recycling information includes toner acceptance standards for  
15 acceptance of toner by the granulation process from the toner collection process and this acceptance standard has at least one standard out of toner color, whether any material is to be mixed with the toner, a material to be mixed, and a toner material.

20 124. The toner recycling method according to claim 119, wherein the recycling information includes a purchase management information, wherein the purchase management information indicates an amount of toner to be received by the granulation process from the toner collection process and the quantity of toner indicated in the purchase  
25 management information is provided by the toner collection process to

the granulation process.

125. The toner recycling method according to claim 120, wherein the recycling information includes a purchase management information,  
5 wherein the purchase management information indicates an amount of toner to be received by the granulation process from the toner collection process and the quantity of toner indicated in the purchase management information is provided by the toner collection process to the granulation process.

10

126. The toner recycling method according to claim 119, wherein in the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is provided in units of lots, a manufacturing code is put on each lot in the  
15 recycling information.

127. The toner recycling method according to claim 120, wherein in the toner collection process a product code is put on the toner and the toner is provided to the granulation process and when the toner is  
20 provided in units of lots, a manufacturing code is put on each lot in the recycling information.

128. The toner recycling method according to claim 122, wherein the communication device is a computer and the recycling information is  
25 transmitted via the Internet between a computer at a site of the

granulation process and a computer at a site of the toner collection process.

129. The toner recycling method according to claim 123, wherein the  
5 communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

10 130. The toner recycling method according to claim 124, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

15

131. The toner recycling method according to claim 125, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection  
20 process.

132. The toner recycling method according to claim 126, wherein the communication device is a computer and the recycling information is transmitted via the Internet between a computer at a site of the  
25 granulation process and a computer at a site of the toner collection

process.

133. The toner recycling method according to claim 127, wherein the communication device is a computer and the recycling information is  
5 transmitted via the Internet between a computer at a site of the granulation process and a computer at a site of the toner collection process.

134. The toner recycling method according to claim 113, further  
10 comprising:

a status management process of managing information that includes at least one of a status of toner collection in the toner collection process, a status of providing of toner to the granulation process and status of use of the granules provided by the granulation  
15 process to a steel manufacturer.

135. The toner recycling method according to claim 134, wherein the status management process includes managing at least one of the data among recycling rate data, material recycling rate data, and energy  
20 recovery rate data that is calculated by using a collection information about a quantity of toner collected, an information to be provided to the granulation process about a quality and a quantity of toner that is supplied to the granulation process, an information which is not provided to the granulation process about a quantity and disposal of a  
25 toner that is collected but not sent to the granulation process, the

information of toner collection, and the information provided to the granulation process, and the information not provided to the granulation process.

- 5    136.    The toner recycling method according to claim 113, wherein the granules are pillow-shaped with blunt corners, the pillow-shape being a shape having a convex top face and a bottom face with same curvature of top and bottom convex surfaces, and the curvature is less than that of a spherical surface of a sphere.

10

137.    The toner recycling method according to claim 113, wherein the granules formed are substantially cylindrical.

138.    The toner recycling system according to claim 135, wherein the  
15 granules are manufactured by mixing a toner with at least one of aluminum dregs, mineral based powder particles, and metal based powder particles made from aluminum dross, aluminum ash, and aluminum mineral dregs generated during an aluminum refining process.

20

139.    A toner recycling system comprising:

          a collection information management unit that manages  
information about a toner collected at a toner collection site;

- a recycling information generation unit that generates recycling  
25 information, wherein the recycling information includes information

about a requirement of toner in the granulation site; and  
a display unit installed at the toner collection site and that  
displays the recycling information.

5    140.    The toner recycling system according to claim 139, wherein the  
granules are used as a flux for manufacturing steel.

141.    The toner recycling system according to claim 139, wherein the  
granules are manufactured by mixing a toner with at least one of  
10    aluminum dregs, mineral based powder particles, and metal based  
powder particles made from aluminum dross, aluminum ash, and  
aluminum mineral dregs generated during an aluminum refining  
process.

15    142.    The toner recycling system according to claim 139, wherein the  
toner collection site includes a toner manufacturing factory where the  
toner is manufactured, a shop where the manufactured toner is sold, a  
recovery center where the sold toner is recovered, and a recycling  
center where the recovered toner is separated.

20

143.    The toner recycling system according to claim 139, wherein the  
toner collection site includes a toner manufacturing factory where the  
toner is manufactured, a manufacturing factory where an image forming  
apparatus and a peripheral equipment are manufactured and the  
25    manufactured toner is used in the image forming apparatus and the

peripheral equipment, a recovery center where the toner used in the image forming device and the peripheral equipment is recovered, and a recycling center where the recovered toner is separated.

- 5     144.     The toner recycling system according to claim 139, wherein the recycling information is generated based on conditions demanded by a prospective purchaser of the granules.

- 10     145.     The toner recycling system according to claim 139, wherein the recycling information includes toner acceptance standards for acceptance of toner by the granulation process and this acceptance standard has at least one standard out of toner color, whether any material is to be mixed with the toner, a material to be mixed, and a toner material.

15

146.     The toner recycling system according to claim 139, wherein the recycling information includes a purchase management information, wherein the purchase management information indicates a quantity of toner accepted by the granulation site from the toner collection site.

20

147.     The toner recycling system according to claim 139, wherein the recycling information includes a toner product code and a manufacturing code of each lot, when the toner is supplied to the granule manufacturer in units of lots.

25

148. The toner recycling system according to claim 139, wherein the recycling information is transmitted via the Internet between information processing units kept at the toner collection site and the granulation site.

5

149. The toner recycling system according to claim 139, further comprising:

a status management unit that manages information that includes at least one of the status of status of toner collection, a status  
10 of providing of toner to the granulation site of toner, and status of use of granules supplied from the granulation site to a steel manufacturer.

150. The toner recycling system according to claim 149, wherein the status management unit manages at least one of the data among  
15 recycling rate data, material recycling rate data, and energy recovery rate data that is calculated by using a collection information about a quantity of toner collected, an information to be provided to the granulation process about a quantity of toner that is supplied to the granulation site, an information which is not provided to the granulation  
20 site about a quantity and disposal of a toner that is collected but not sent to the granulation site, the information of toner collection, the information provided to the granulation site, and the information not provided to the granulation site.

25



151. The toner recycling system according to claim 139, wherein the toner collection information management unit manages information for each toner having a different color.

### ABSTRACT OF THE DISCLOSURE

A toner recycling method and a toner recycling system use two personal computers and a display. A personal computer carries out management of information of toner, which is collected at a toner  
5 collection site. Another personal computer generates recycling information, which includes information about toner requirement of a granule manufacturer. A display at the toner collection site displays recycling information. Collected toner is used for manufacturing flux by mixing with aluminum dross, aluminum ash, aluminum dregs etc.

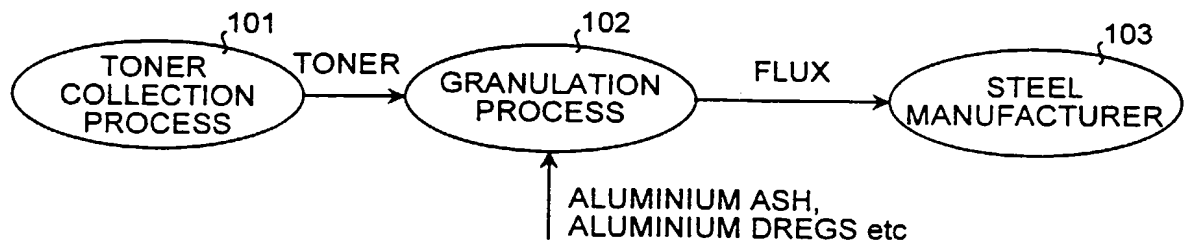


FIG.2

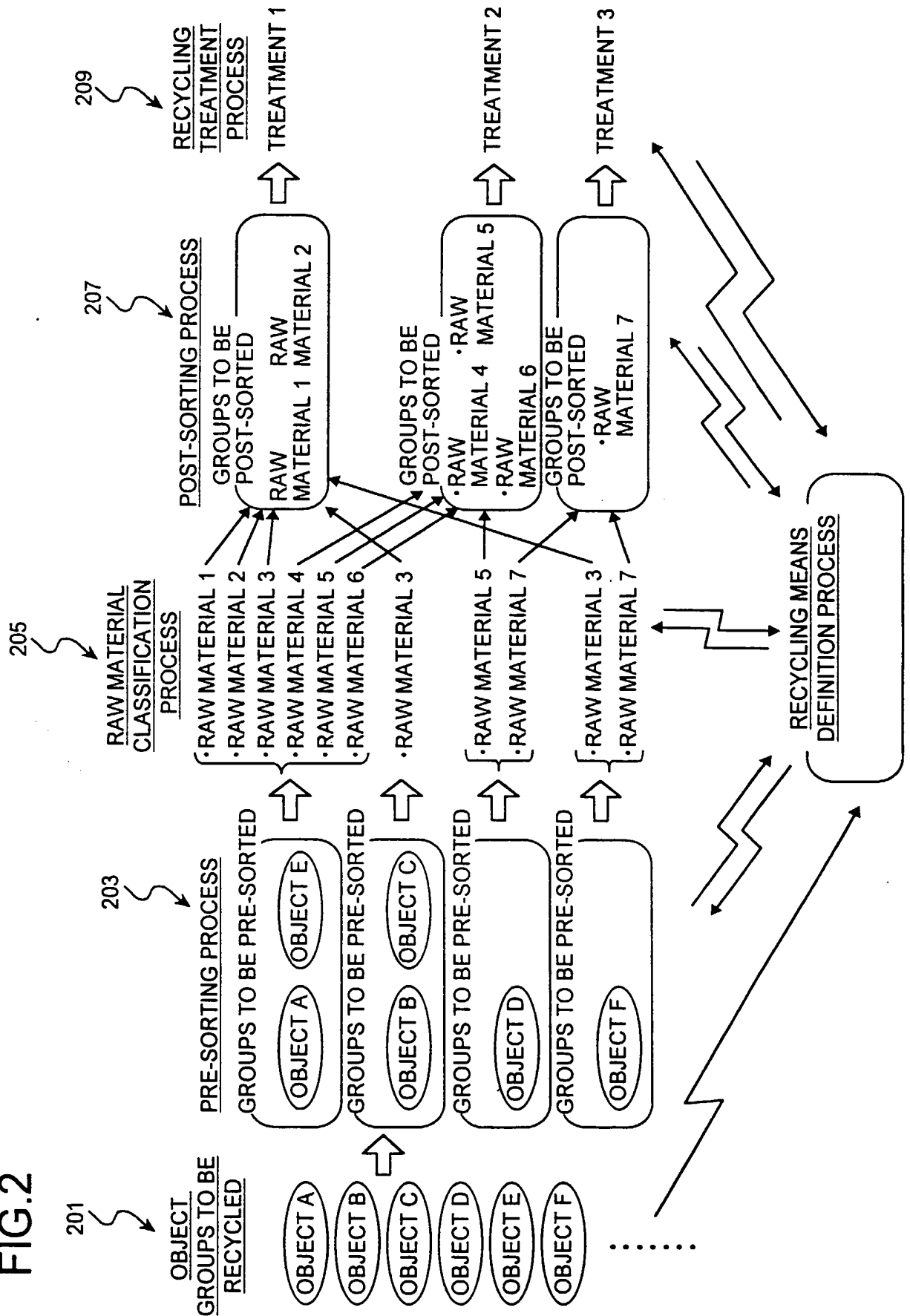


FIG.3

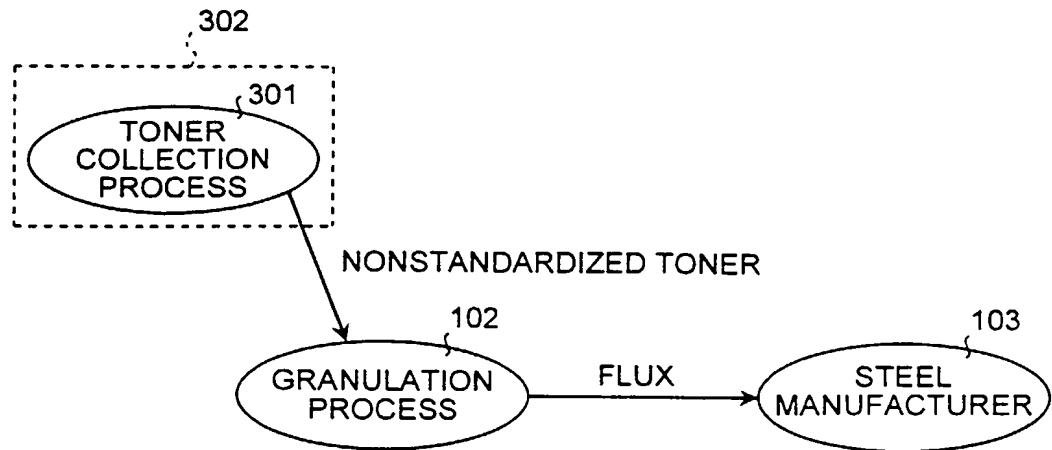


FIG.4

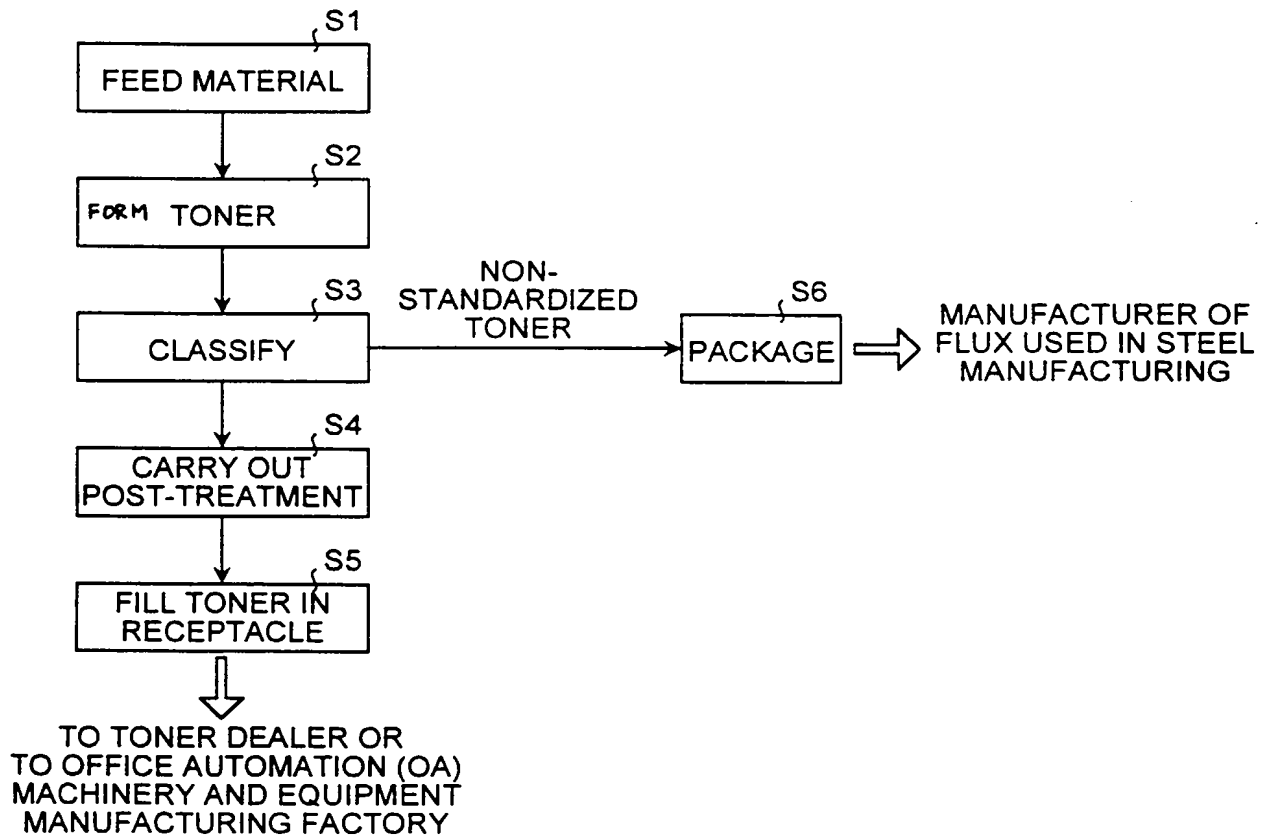


FIG.5

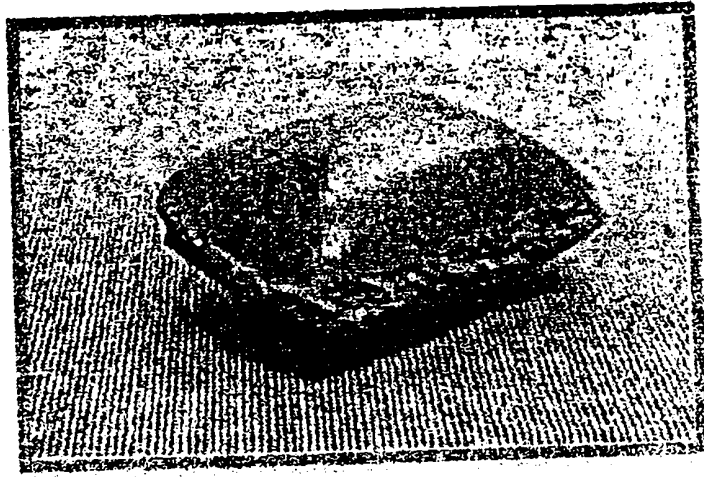


FIG.6

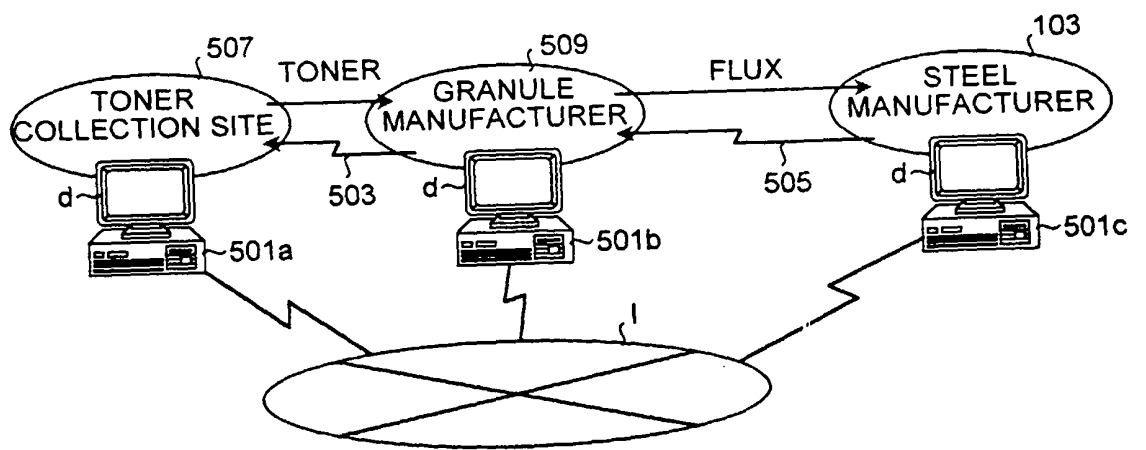
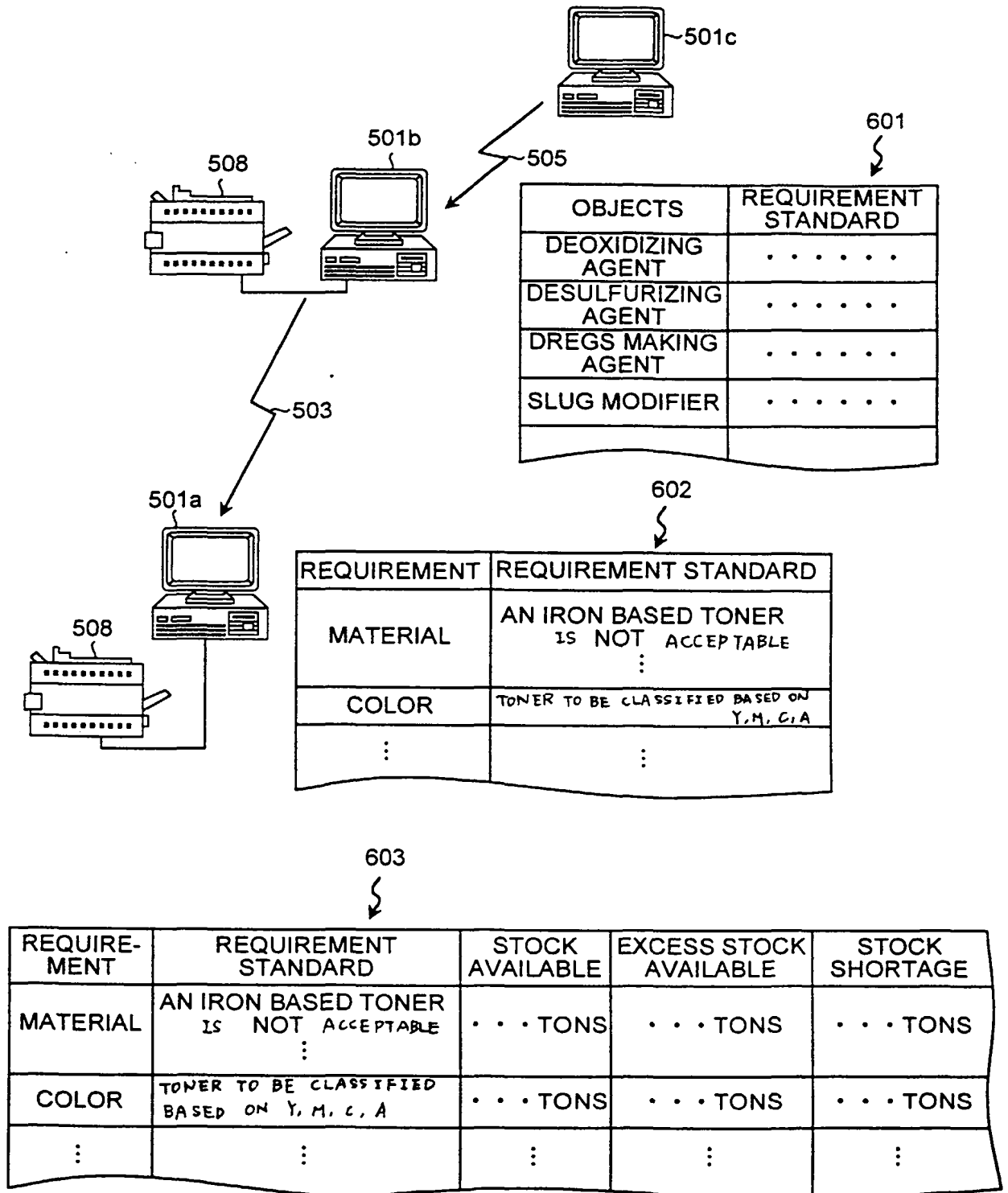


FIG. 7



701

FIG.8A

	JANUARY 2004	FEBRUARY 2004	
QUANTITY OF FLUX PURCHASED	DEOXIDIZING AGENT - TONS :		

702

FIG.8B

PRODUCT CODE	JANUARY 2004		
QUANTITY OF TONER PURCHASED	Y: ○ TONS M: ○ TONS C: ○ TONS B: ○ TONS		
Lot.No.	○○○○○	△△△△	

703

FIG.8C

PRODUCT CODE	JANUARY 2004		
QUANTITY OF TONER PURCHASED	Y: ○ TONS M: ○ TONS C: ○ TONS B: ○ TONS		
Lot.No.	○○○○○	△△△△	
	DATA OF QUANTITY DATA OF STORAGE PLACES :	:	:



FIG. 9

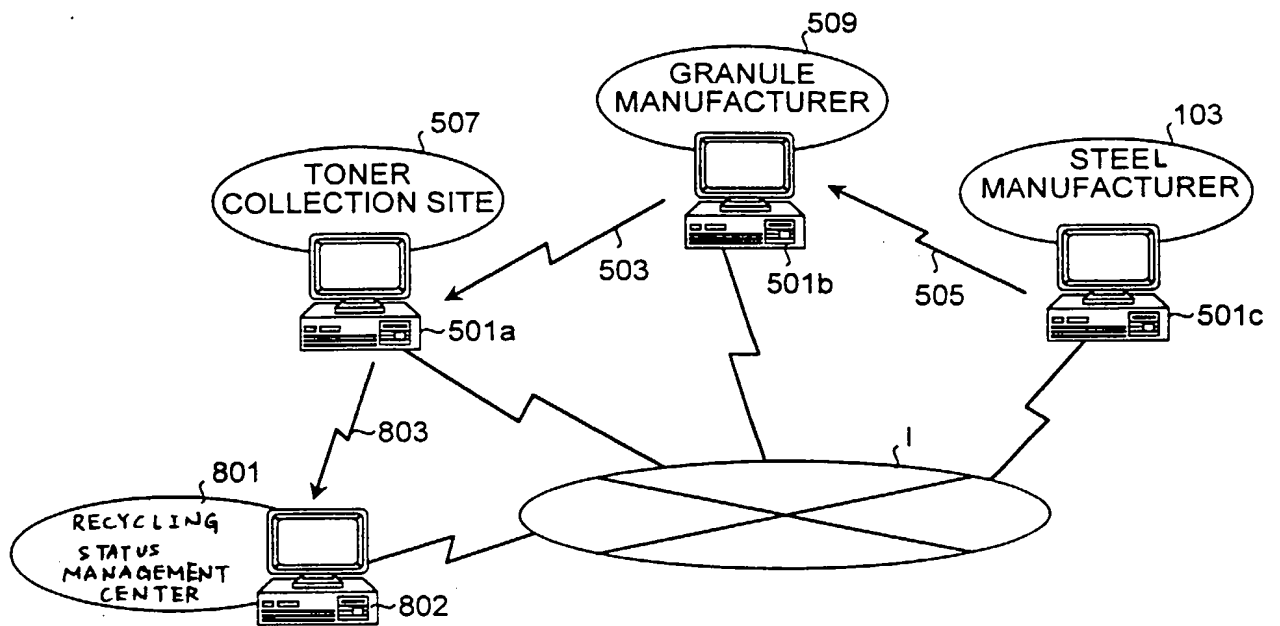


FIG.10A

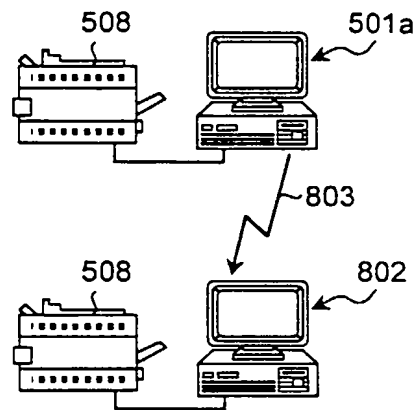


FIG.10B

803  
↓

INPUT (QUANTITY COLLECTED)	OUTPUT	
	MEANS	QUANTITY
~TONS/MONTH	GRANULE MANUFACTURER	~TONS/MONTH
	IRON WORKS	~TONS/MONTH
	⋮	⋮
○○○○(MONTH) ○○○○(YEAR)		
RECYCLING RATE: ~%		
MATERIAL RECYCLING RATIO:~ %		
ENERGY RECOVERY RATIO:~ %		

m

FIG.11

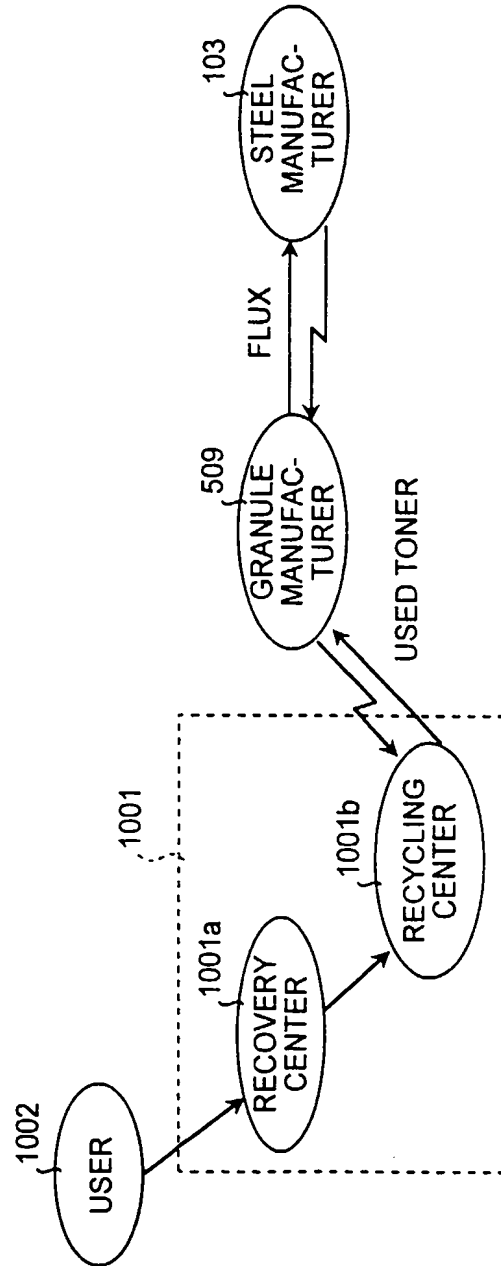


FIG.12

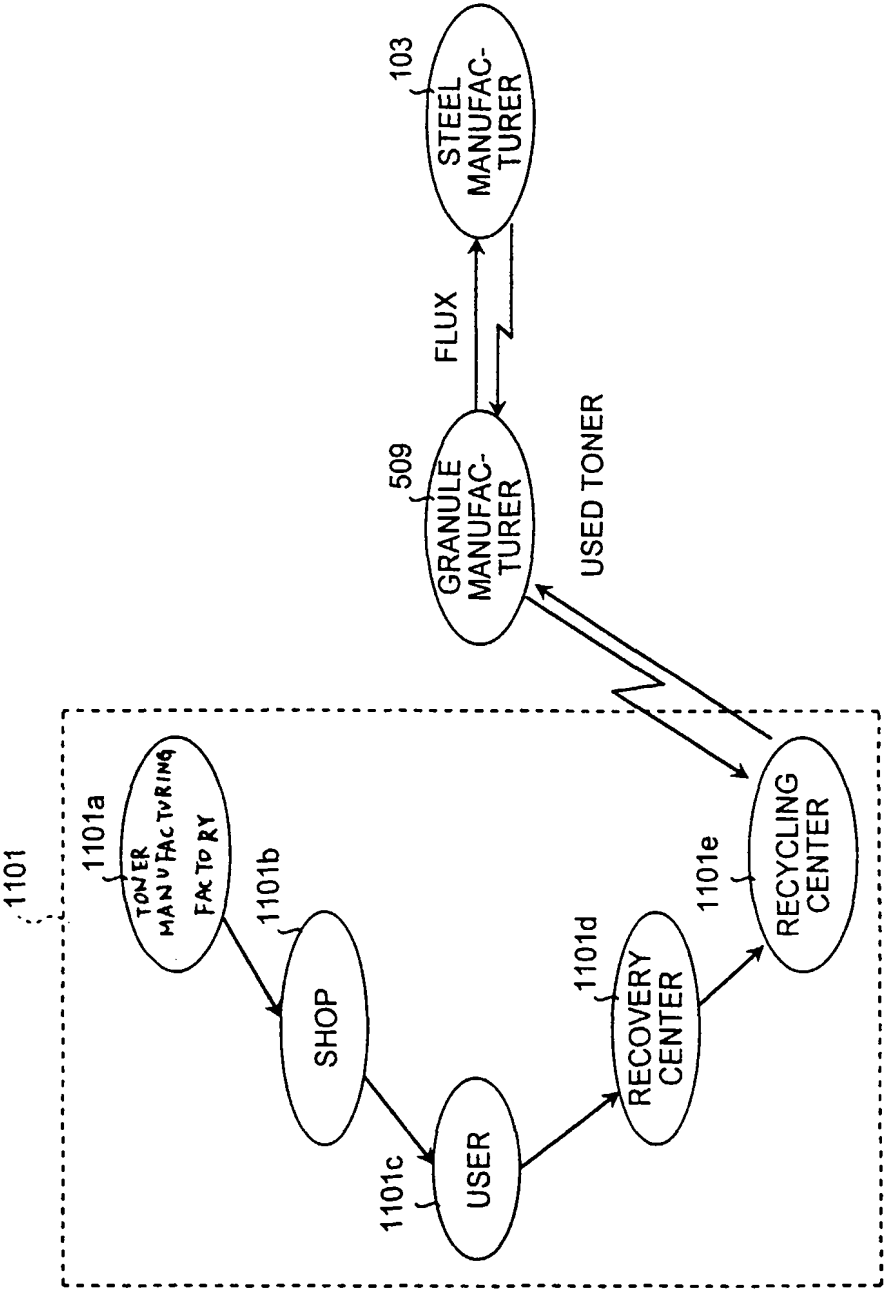


FIG.13

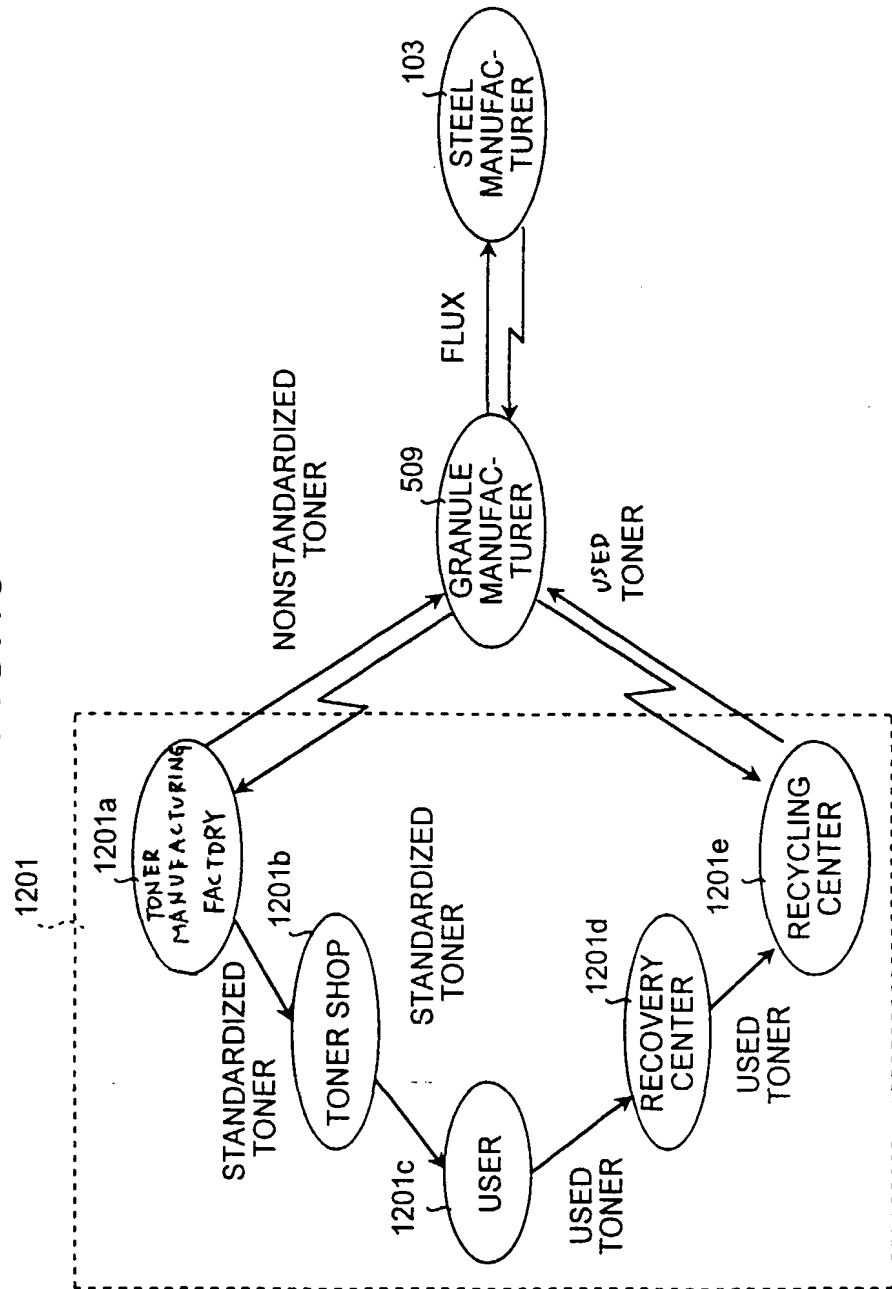


FIG.14

